(HYDRA

FUNDAM

Part

Naval Air Technical Training C

CNATT-N678 PAT

d in the past. It is a self-training text and is designe
instruction at the speed at which you can master it best.
taught in this programmed lesson is essential material o
to go deeper into the subject and broaden your knowledge,
o on your own.

rush through this book. There is a time limit for the
esson, but in most cases you will finish in the allotted
t, you will be required to complete it for home study.

ructor will be present to answer any questions which you
o not hesitate to let him know if you become confused, ne
ire additional information. This type of instruction all
tor to give you individual assistance, while the rest of
ues the lesson.

not a test. It is a proven means of learning and requir
pond as indicated throughout the book. Information will
ll blocks, called frames. After each bit of information,
required either to fill in the blank or to circle an answ
the best of several choices given, etc.

uess at answers. If you are not sure, review the lesson
he correct answer will follow your response to let you kn
oing.

r, if the answer you write down does not correspond with
answer given, make sure it is straightened out in your mi
nuing.

GOOD LUCK

Objectives

Student will:

1. Select, from a given list, the primary uses of hydrauli (Frame 1)
2. Select, from a given list, the secondary uses of hydrau (Frame 3)
3. Select, from a given list, the auxiliary uses of hydrau (Frame 4)
4. Label the components in a basic hydraulic system. (Fram
5. Match each unit in the basic hydraulic system with its purpose. (Frame 20)
6. Label the components in a basic hydraulic, power-driven system. (Frame 21)
7. State the most commonly used material for hydraulic tub (Frame 29)
8. State the material used for hydraulic tubing when it is subjected to intense heat. (Frame 34)
9. State the type of line used to connect moving parts. (Frame 37)

NOTE: The frame number listed after each objective refers to the first frame concerning that objective. It provides a reference for review or home study.

Hydraulics combines the advantages of light weight, ease of installation, simplification of inspection, and minimum maintenance requirements. Hydraulic operations are also almost 100 percent efficient, with only a negligible loss because of fluid friction. In aviation, there are primary, secondary, and auxiliary uses for hydraulics.

2. The primary uses of hydraulics involve flight controls, landing gear, wing flaps, and wheel brakes. Select from the list below, the <u>primary</u> uses of hydraulics. Place the letter P beside your choices.

___ a. Landing gear.
___ b. Jacking aircraft.
___ c. Wing flaps.
_____ d. Gun chargers.
_____ e. Bomb-bay doors.
_____ f. Flight controls.
_____ g. Wheel brakes.

P f.
P g.

doors. Select from the list below the pri
and the secondary use of hydraulics. Place
letter P (primary) or S (secondary) beside yo
choices.

_____ a. Landing gear.
_____ b. Bomb-bay doors.
_____ c. Gun chargers.
_____ d. Wing flaps.
_____ e. Radomes.
_____ f. Flight contro

P d.
S e.
P f.

4. The auxiliary uses of hydraulics involve ja
aircraft, hydraulic test benches, and testi
components. Select, from the list below, th
secondary and auxiliary uses of hydraulics.
Place the letter S (secondary) or A (auxilia
beside your choices.

_____ a. Bomb-bay doors.
_____ b. Jacking aircraft.
_____ c. Radomes.
_____ d. Gun chargers.
_____ e. Testing compo
_____ f. Hydraulic tes
benches.

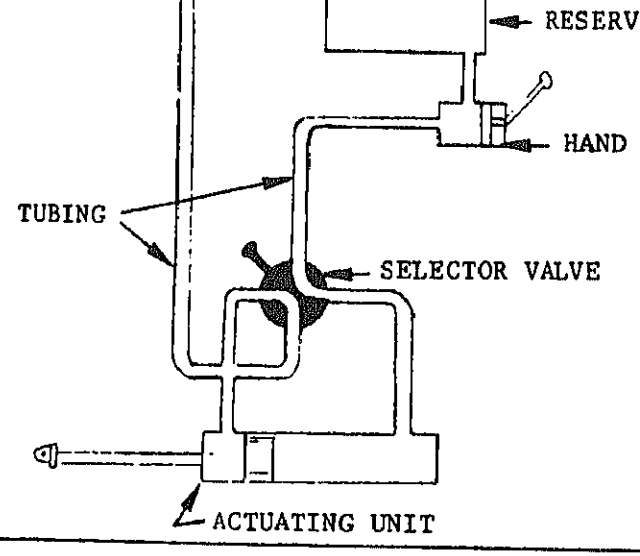
a. Landing gear.
b. Testing components.
c. Jacking aircraft.
d. Radomes.
e. Flight controls.
f. Wing flaps.
g. Bomb-bay doors.
h. Hydraulic test benches.
i. Gun chargers.

6. Select, from the list below, the <u>secondary</u> uses of hydraulics. Circle the letter beside your choices.

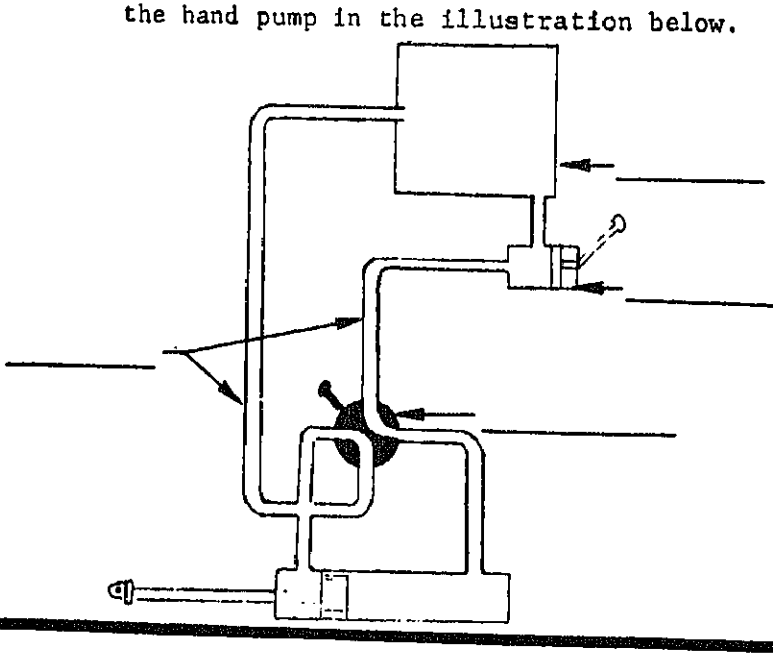
a. Landing gear.
b. Testing components.
c. Jacking aircraft.
d. Radomes.
f. Wing flaps.
g. Bomb-bay doors.
h. Hydraulic test benches.
i. Gun chargers.

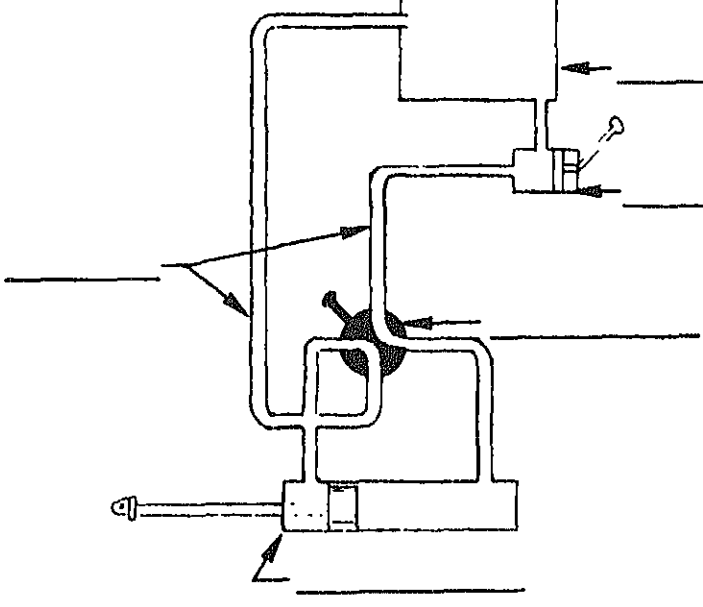
7. Select, from the list below, the <u>auxiliary</u> uses of hydraulics. Circle the letter beside your choices.

a. Landing gear.
b. Testing components.
c. Jacking aircraft.
f. Wing flaps.
g. Bomb-bay doors.
h. Hydraulic test

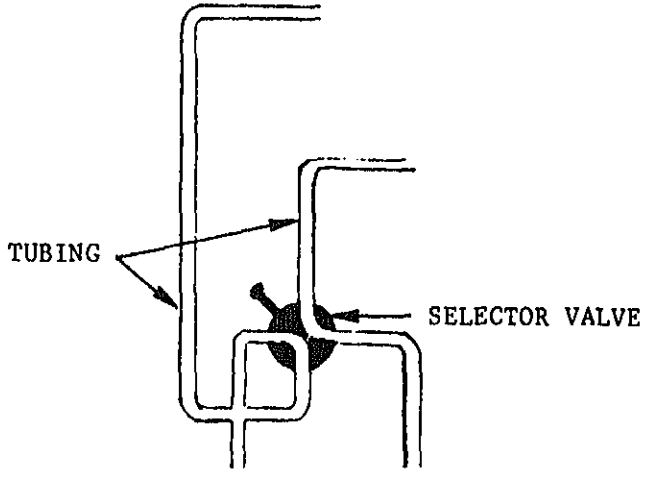


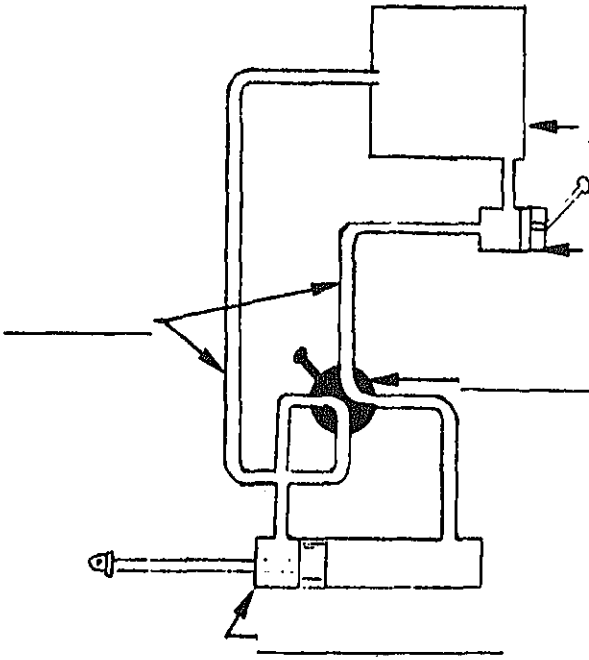
9. The hand pump provides a flow of fluid. L
the hand pump in the illustration below.



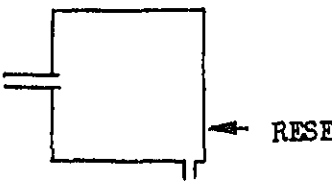


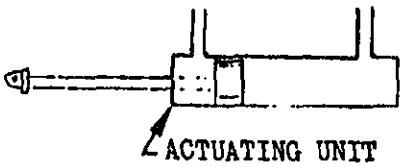
Answer to frame 10.

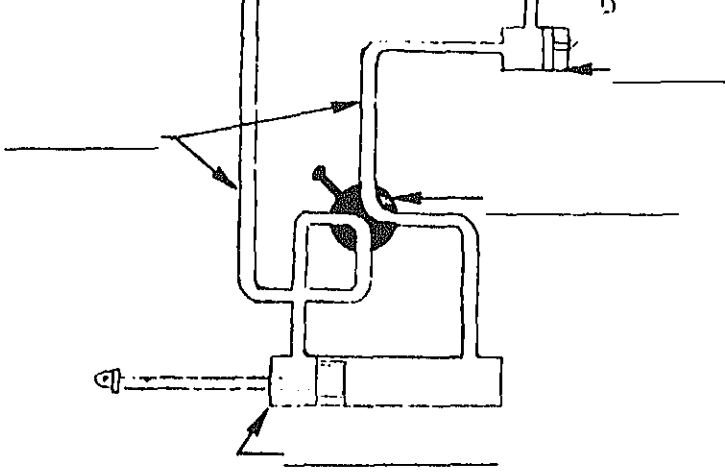




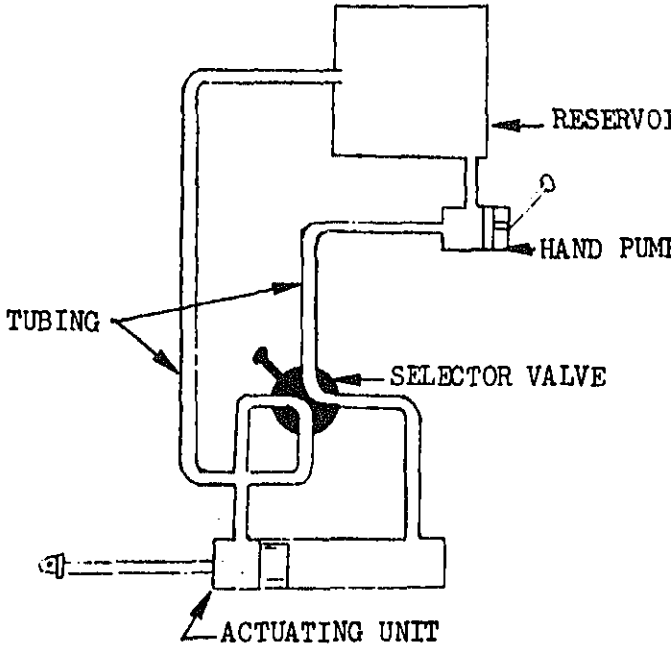
Answer to frame 11.







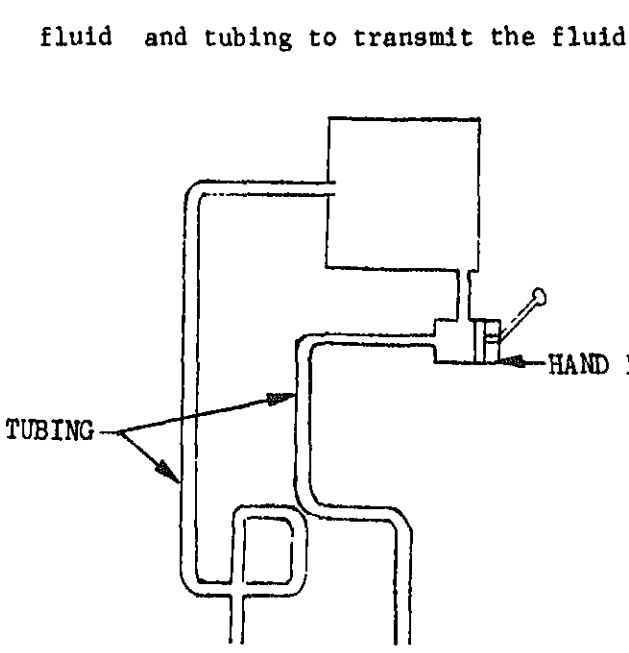
Answer to frame 12.



A supply of fluid is held in the _____

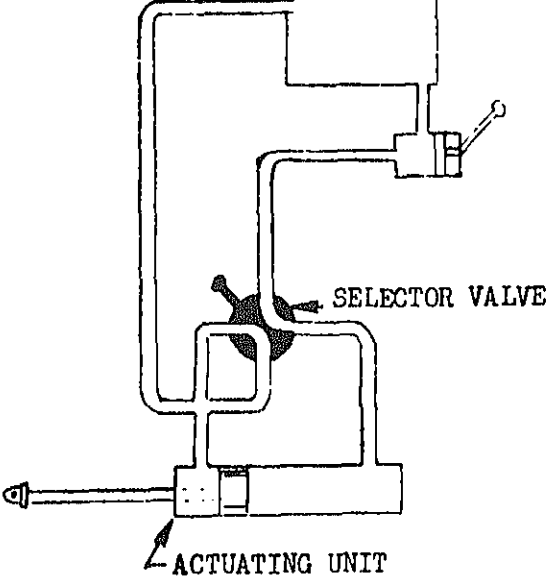
-voir

14. In the illustration below, we have added hydraulic hand pump to provide the flow fluid and tubing to transmit the fluid



To provide a flow of fluid, the _____

_____ is used.

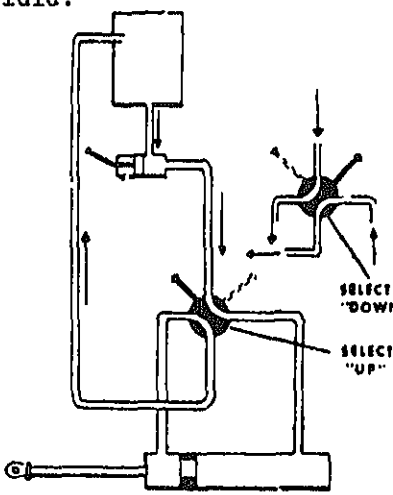


The selector valve directs the flow of fluid, and the fluid pressure is converted into useful work by the _____ _____.

16. In the basic system, the reservoir's purpose is to hold a _____ of fluid.

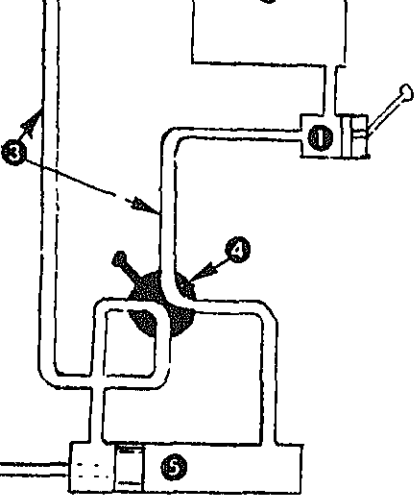
_____ of fluid.

18. In the illustration below, you can see selector valve is used to _____ the flow of fluid.



ct

19. The actuating unit is used to convert f
_ pressure into _____ _____



___ Directs flow of flu

___ Converts fluid pres
into useful work.

___ Provides the flow o
fluid.

Response to frame 20.

❷ Holds a supply of hydraulic fluid.

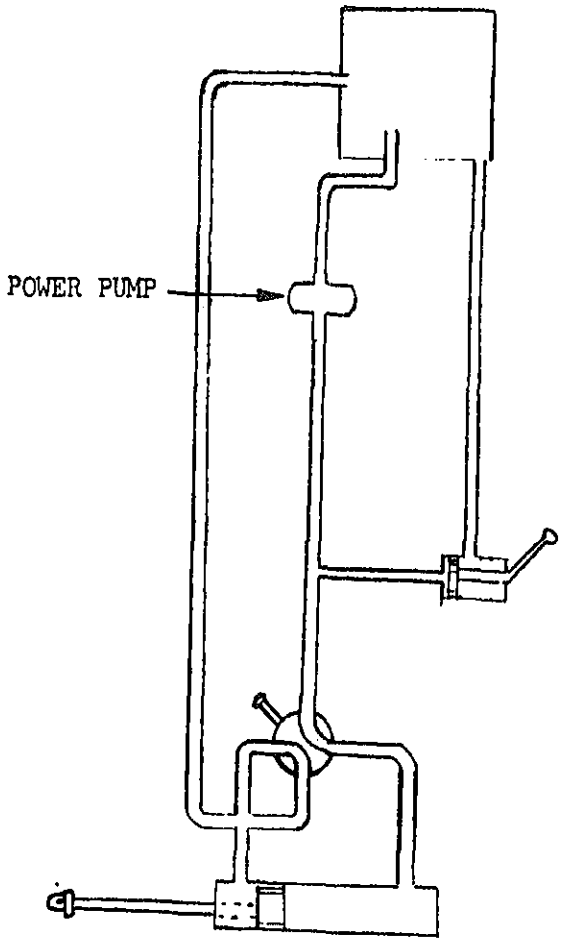
❸ Transmits the fluid.

❹ Directs flow of fluid.

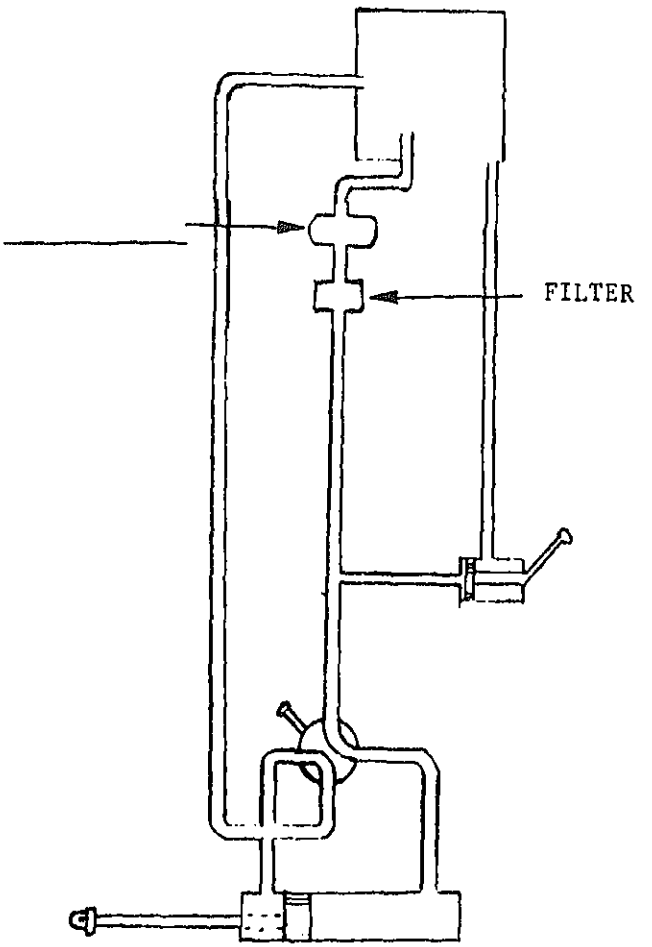
❺ Converts fluid pressure into usefu

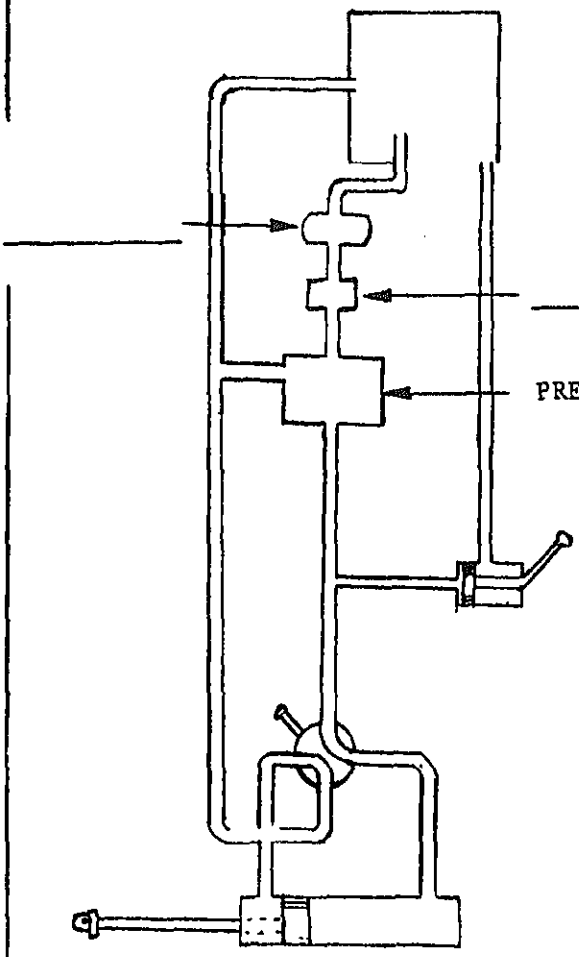
❶ Provides the flow of fluid.

may be made to it for the purpose of providing an additional source of power.



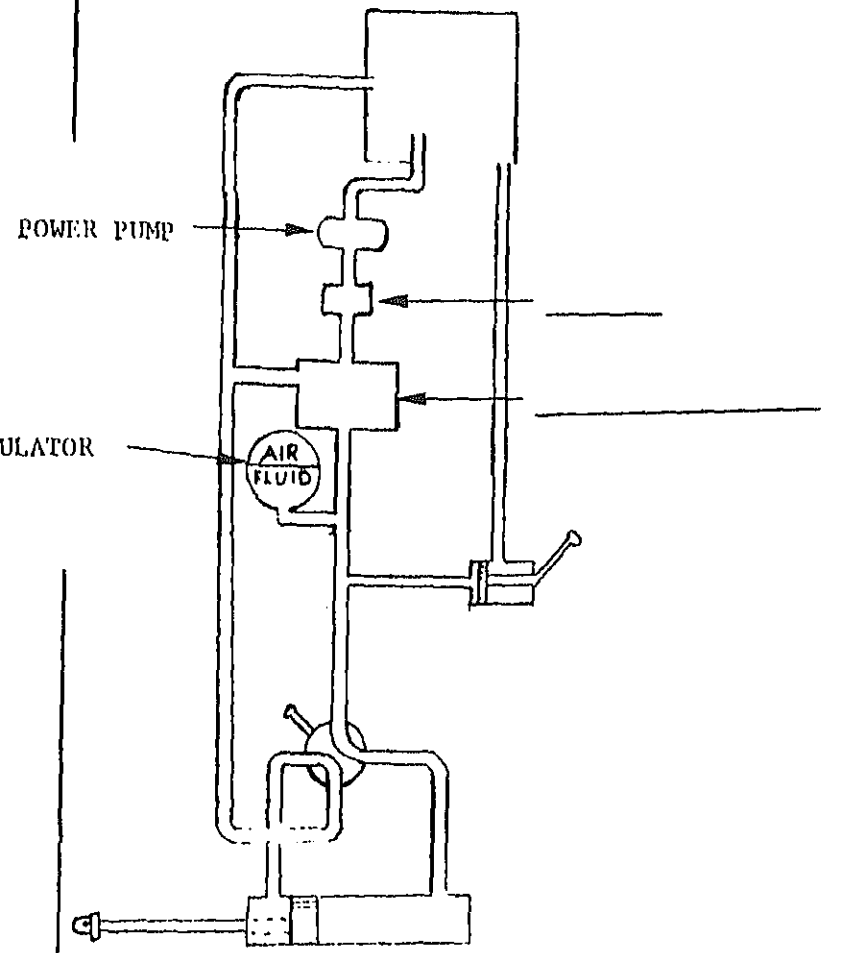
In the illustration above, we provided an additional source of power with a _____ _____.


FILTER


PRESSURE REGULATO

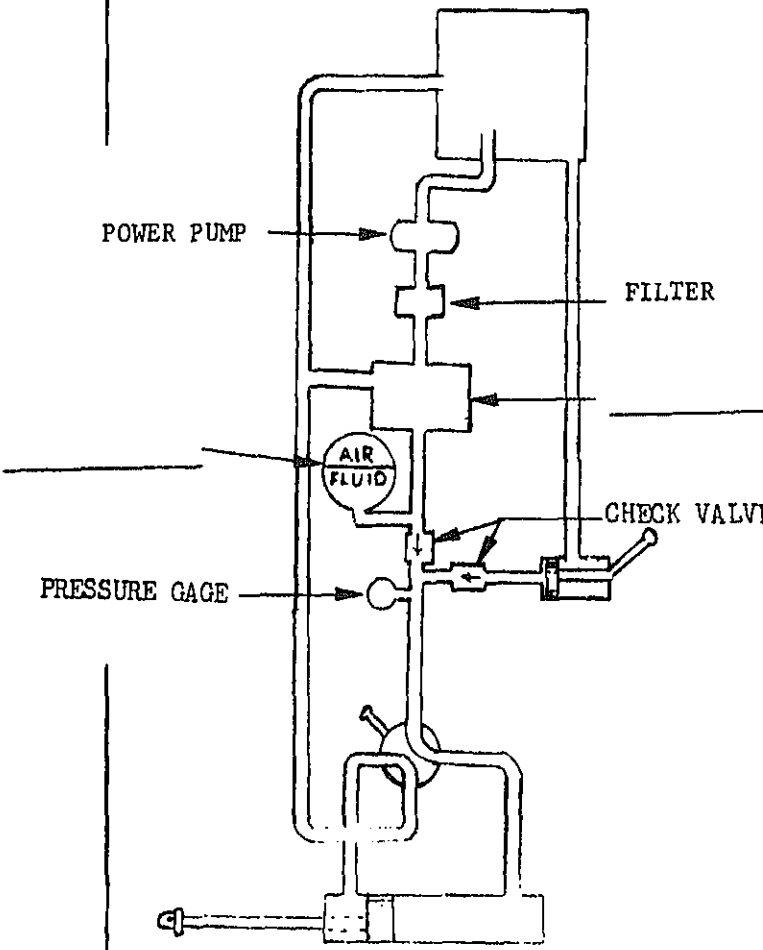
actuating unit.

Label the filter and the pressure regulator.



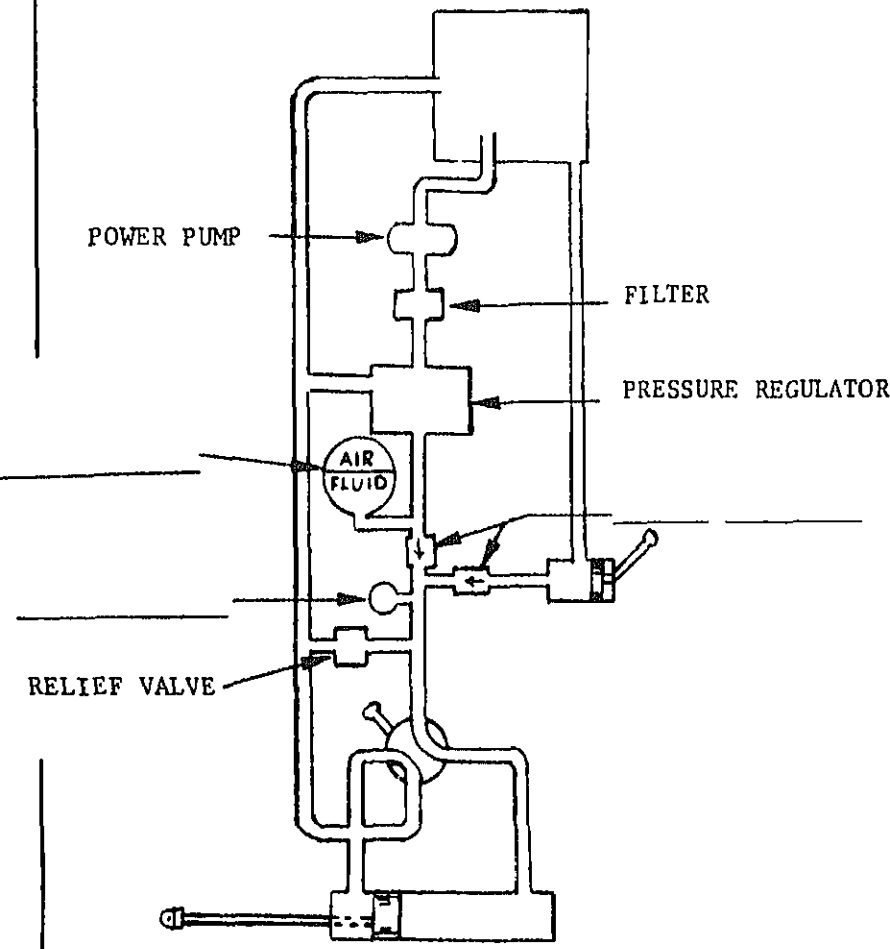
EGULATOR

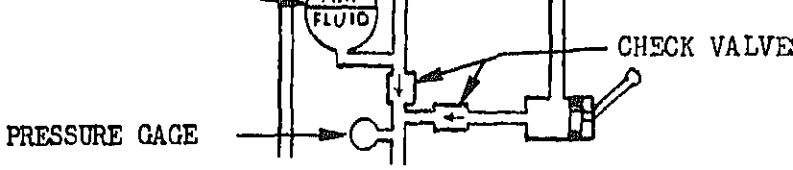
Label the pressure regulator and accumulator.



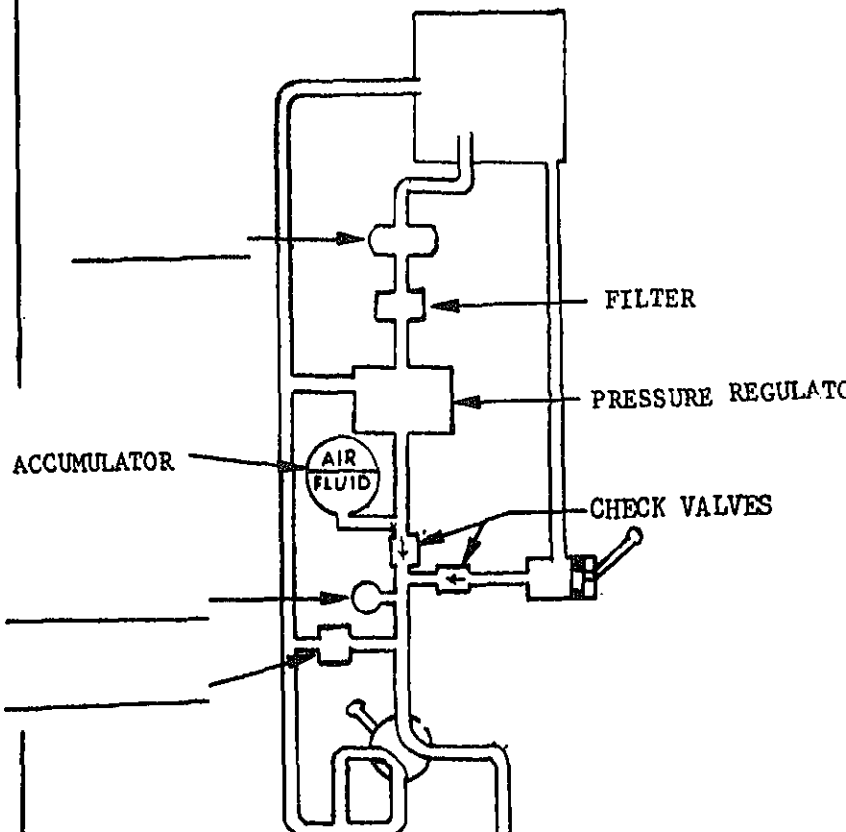
bypassed back to the reservoir.

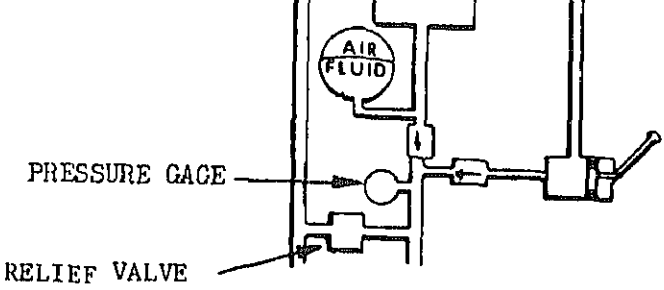
Label the accumulator pressure gage and the check valves.





27. In the illustration below, label the power pump, the relief valve, and the pressure gage.





28. Label each unit in the illustration below.

a. Power pump.

b. Check valves.

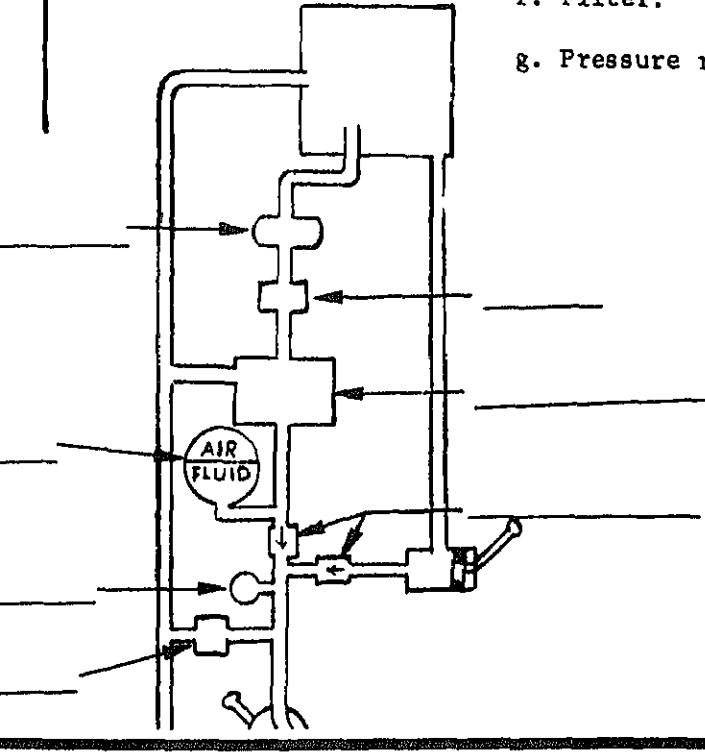
c. Accumulator.

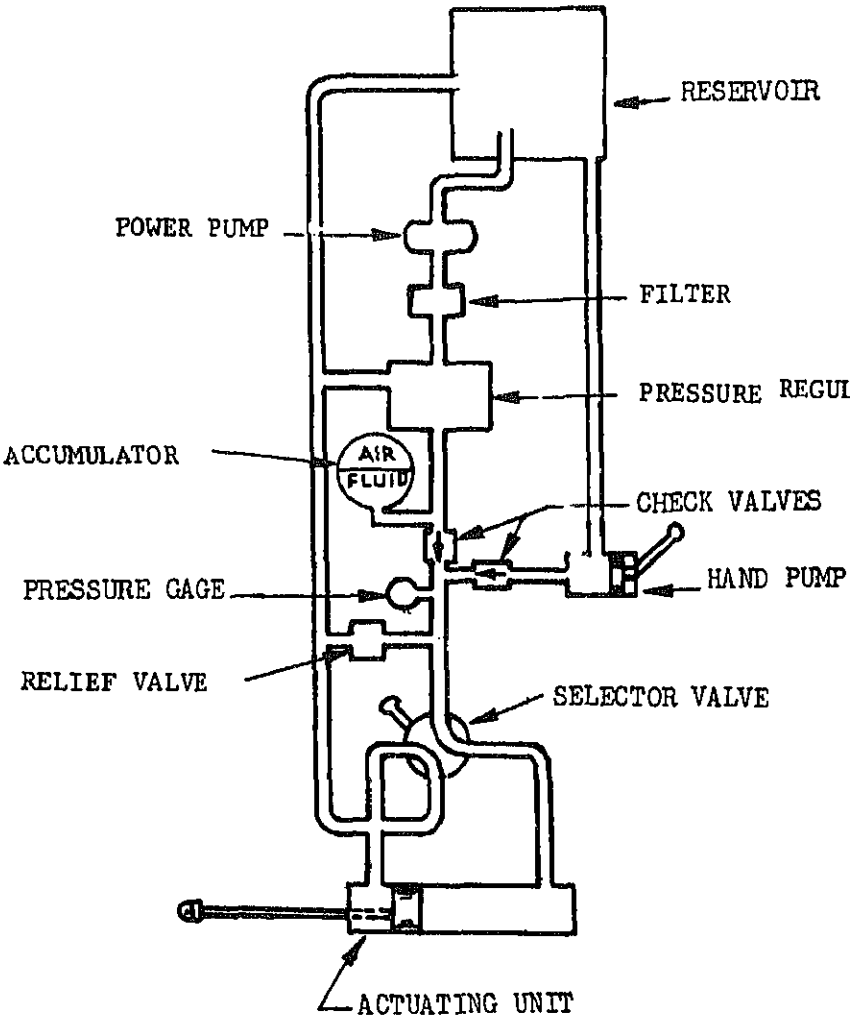
d. Pressure gage.

e. Relief valve.

f. Filter.

g. Pressure regulator.




RESERVOIR
POWER PUMP
FILTER
PRESSURE REGUI
ACCUMULATOR
AIR
FLUID
CHECK VALVES
PRESSURE GAGE
HAND PUMP
RELIEF VALVE
SELECTOR VALVE
ACTUATING UNIT

stainless steel tubing is used in certain parts of many systems.

The most commonly used material for hydraulic fluid lines is aluminum _____.

30. As a general rule, exposed lines and lines which are subjected to abrasion or to intense heat are made of stainless steel.

Stainless steel is used for lines subjected to abrasion or to intense_____.

31. Flexible hoses are generally employed in connection with moving parts or where it is necessary to install a line that is subjected to considerable vibration.

In locations where the use of rigid tubing is impractical, _____ _____ are used.

pressures up to 1,500 p.s.i., and alloy
is used for lines carrying pressures u
3,000 p.s.i.

Alloy 5052 and alloy 6061 are both
_____ alloys.

inum

33. Stainless steel, flexible rubber hose,
aluminum alloy are all hydraulic fluid
material; however, the most commonly
is _____ _____.

inum
y

34. State the most commonly used material
hydraulic tubing.

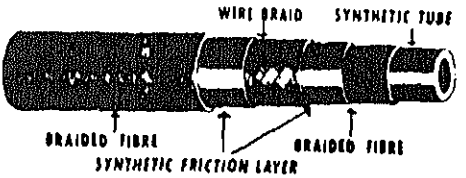
inum
y.

35. Stainless steel is used for lines whic
subjected to abrasion or to intense he
When lines pass through the engine com
or other places where intense heat may
encountered, we must use _____

37. State the material used for tubing that is subjected to intense heat.

38. The illustration below is one type of flexible hose.

MS 28741



When connecting moving parts, _____ _____ is normally used.

39. When it is necessary to install a line that is subjected to considerable vibration or in a location where the use of rigid tubing is impractical, _____ _____ is used.

lexible
ose.

YOU HAVE FINISHED PART II.

NOTIFY YOUR INSTRUCTOR

lect, from the list below, the primary uses of hydraulics.

Circle the letter beside your choices.

Landing gear.

Testing components.

Jacking aircraft.

Radomes.

Flight controls.

f. Wing flaps.

g. Bomb-bay doors.

h. Hydraulic test benches

i. Gun chargers.

lect, from the list below, the secondary uses of hydraulics.

Circle the letter beside your choices.

Landing gear.

Testing components.

Jacking aircraft.

Radomes.

Flight controls.

f. Wing flaps.

g. Bomb-bay doors.

h. Hydraulic test benches

i. Gun chargers.

lect, from the list below, the auxiliary uses of hydraulics.

Circle the letter beside your choices.

Landing gear.

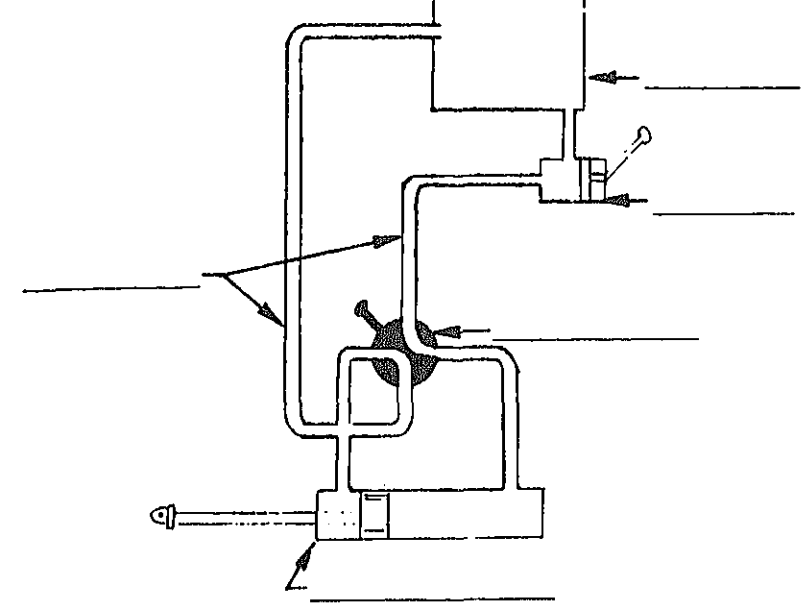
Testing components.

Jacking aircraft.

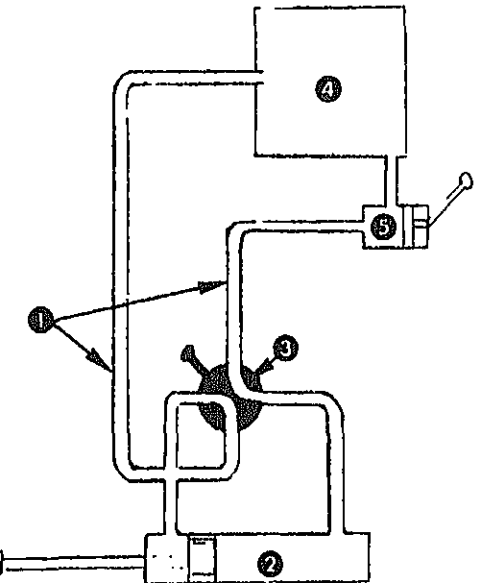
f. Wing flaps.

g. Bomb-bay doors.

h. Hydraulic test benches.



Match each unit with the statement of its purpose.



___ Holds a supply of hydraulic fluid.

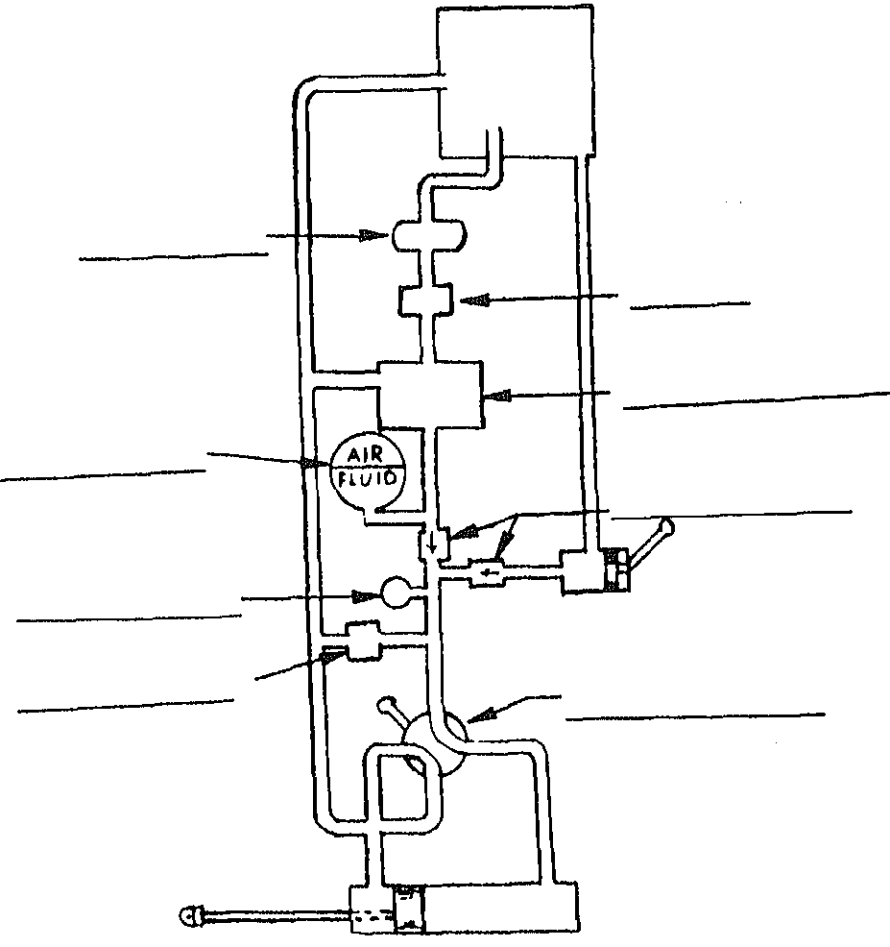
___ Transmits the flui

___ Directs flow of fl

___ Converts fluid pre into useful work.

___ Provides the flow fluid.

Pressure regulator.



What is the material used for hydraulic tubing that is subj

to intense heat?

What type of line is used to connect moving parts?
